

Claims

[1] A carbon nanotube-dispersed polyimide saturable absorber excellent in an optical quality, obtainable by mixing a carbon nanotube dispersion liquid comprising a carbon nanotube, an amide-based polar organic solvent, and a nonionic surfactant and/or a polyvinylpyrrolidone (PVP) with a mixture solution of a solvent soluble polyimide and an organic solvent.

[2] The saturable absorber according to claim 1, wherein the carbon nanotube is a single-walled carbon nanotube.

[3] The saturable absorber according to claim 1, characterized in that the amide-based polar organic solvent comprises N-methylpyrrolidone (NMP) and/or dimethylacetamide.

[4] The saturable absorber according to claim 1, characterized in that the nonionic surfactant is a polyoxyethylene surfactant.

[5] The saturable absorber according to claim 1, characterized in that the content of the nonionic surfactant is 0.005 to 5% by weight in the carbon nanotube dispersion liquid.

[6] The saturable absorber according to claim 1, characterized in that the content of the polyvinylpyrrolidone (PVP) is 0.1 to 10% by weight in the carbon nanotube dispersion liquid.

[7] A method for producing a saturable absorber, characterized by comprising the steps of dispersing a single-walled carbon nanotube in a mixture solution of an amide-based polar organic solvent and a nonionic surfactant under intensive stirring, mixing the resultant dispersion liquid with a polyimide mixed organic solvent, and removing the solvent.

[8] A method for producing a saturable absorber, characterized by comprising the steps of dispersing a single-walled carbon nanotube in a mixture solution of an amide-based polar organic solvent and a nonionic surfactant under intensive stirring, mixing a polyvinylpyrrolidone (PVP) therewith, mixing the resultant dispersion liquid with a polyimide mixed organic solvent, and removing the solvent.

[9] The method for producing a saturable absorber according to claim 7, characterized in that the obtained single-walled carbon nanotube dispersion liquid is treated with a filter having a retaining particle size of 0.1 to 3.0 μm to obtain a dispersion liquid comprising fine particles of the single-walled carbon nanotube.